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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,277	07/17/2006	Adam Karlsson	10400-000205/US	7965
30593 7590 01/09/2008 HARNESS, DICKEY & PIERCE, P.L.C. P.O. BOX 8910 RESTON, VA 20195			EXAMINER BITAR, NANCY	
			ART UNIT 2624	PAPER NUMBER
			MAIL DATE 01/09/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/565,277	Applicant(s) KARLSSON, ADAM	
	Examiner Nancy Bitar	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 20 January 2006.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>1/20/2006</u> | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 101*

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.

When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and *Warmerdam*, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).

In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See *Lowry*, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

1. Claim(s) 6 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 6 defines a "digital storing medium including a program" embodying functional descriptive material. However, the claim does not define a computer-readable medium or memory and is thus non-statutory for that reason (i.e., "When functional descriptive material is recorded on some

computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized" – Guidelines Annex IV). That is, the scope of the presently claimed "digital storing medium including a program" can range from paper on which the program is written, to a program simply contemplated and memorized by a person. The examiner suggests amending the claim to embody the program on "computer readable medium encoded with a computer program" or equivalent in order to make the claim statutory. Any amendment to the claim should be commensurate with its corresponding disclosure.

### **Examiner Notes**

2. Examiner cites particular columns and line numbers in the references as applied to the claims below for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested that, in preparing responses, the applicant fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-8 rejected under 35 U.S.C. 103(a) as being unpatentable over Xu et al (Gradient vector flow: A new External Force for Snakes) in view of Oguz et al (US 2003/0142750).

As to claim 1, Xu et al teaches a method of determining a sought object contour in a digital microscope image, which includes a plurality of image elements and reproduces a biological material, the method comprising:

assigning edge values to at least a first subset of the image elements in the image (defining an edge map  $f(x,y)$  derived from the image  $I(x,y)$  having the property that it is larger near the image edges<sup>2</sup>, page 68, section 3.1); assigning values of a first gradient vector component whose values each comprise a first linear combination of edge values of some surrounding image elements to at least a second subset of the image elements in the image (We define the *gradient vector flow* (GVF) field to be the vector field  $v(x,y)=(u(x,y), v(x,y))$  that minimizes the energy functional, see equation 10, and page 67 section 2.1); assigning values of a second gradient vector component whose values each comprise a second linear combination of edge values of some surrounding image elements to at least a third subset of the image elements in the image ( see equation 10 and section 3.2); and calculating an estimate of the sought object contour based upon values of the first and the second gradient vector

components (The steady-state solution of these linear parabolic equations is the desired solution of the Euler equations (11a) and (11b), page 68, section 3.2).

While Xu et al meets a number of the limitations of the claimed invention, as pointed out more fully above, Xu teaches the final calculation of the sought object but fails to specifically teach the calculation is an estimate. Specifically, Oguz et al. teaches the transform coefficients include respective horizontal frequency transform coefficients and respective vertical frequency transform coefficients for each block of pixels, and the method includes using a lowest nonzero horizontal frequency transform coefficient and a lowest nonzero vertical frequency transform coefficient for at least one of the blocks of pixels for computing an approximate gradient vector of an edge associated with said at least one of the blocks of pixels. Because the calculation of the contour based on the frequency transformation, it would have been obvious to one of ordinary skill in the art to use the estimation of the contour based on the frequency transformation where equations 11a and 11b of Xu et al. may be quickly solved using the Fast Fourier transformation (frequency transformation) in order to improve the analysis of medical images with less time when using the snakes with GVF performance. Therefore, the claimed invention would have been obvious to one of ordinary skill in the art at the time of the invention by applicant.

As to claim 2, Xu et al teaches the method as claimed in claim 1, wherein the first and the second linear combination each correspond to, in arbitrary order, a filtering in the image plane with a 3 by 3 filter and one differentiation in one direction each in the

image plane (note that the equation are decoupled and therefore can be solved as separate scalar partial differential equation, see section 3.2).

As to claim 3, Xu et al teaches the method as claimed in claim 2, wherein the 3 by 3 filter corresponds to a filtering with a weighted combination of a Laplace filter and a unity filter (page 68, section 3.2, gradient vector flow, note that  $\Delta$  is co called Laplace operator ).

As to claim 4,7,8 Oguz et al teaches method as claimed in claim 1, wherein the first and the second linear combinations are calculated using Fourier transform [paragraph [0081] and claim 11) .

Claim 5 differ from claim 1 only in that claim 1 is a method claim whereas, claim 5 is an apparatus claim. Thus, claim 5 is analyzed as previously discussed with respect to claim 1 above.

Claim 6 differ from claim 1 only in that claim 1 is a method claim whereas, claim 6 is an computer readable medium. Thus, claim 6 is analyzed as previously discussed with respect to claim 1 above.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nancy Bitar whose telephone number is 571-270-1041. The examiner can normally be reached on Mon-Fri (7:30a.m. to 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 571-272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

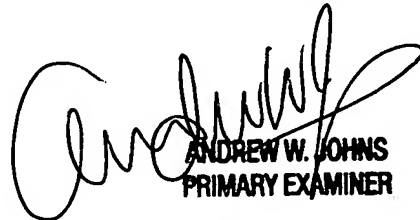
Application/Control Number:  
10/565,277  
Art Unit: 2624

Page 7

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nancy Bitar

01/5/2008

  
ANDREW W. JOHNS  
PRIMARY EXAMINER